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NEW PAGE OF SPACE ANNALS

PRESS-CONFERENCE ON THE FLIGHT OF SPACESHIPS

"SOYUZ-4" AND "SOYUZ-5"

(TASS RELEASE)

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NEW PAGE OF SPACE ANNALS

PRESS CONFERENCE ON THE FLIGHT OF SPACESHIPS

"SOYUZ-4" and "SOYUZ-5" *

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*Highlights of a TASS Release
by Andre L. Brichant

The majestic Assembly Hall of the Moscow State University was never as housefull as yesterday, when Soviet and foreign newspapermen convened with all sorts of cameras and eager to hear the details on the latest Soviet space experiment from the mouths of the very participants.

This press-conference was indeed fully devoted to the successful realization of the docking of two manned spacecrafts "SOYUZ-4" and "SOYUZ-5", the transfer of two cosmonauts from one craft to the other, and the encounter with the fliers-cosmonauts, heroes of the Soviet Union, comrades V. A. Shatalov, B. V. Volynov, E. V. Khrynov and A. S. Yeliseyev. The appearance of these four heroes before the press-conference presidium was greeted with an ovation.

The press-conference was opened by M. V. KELDYSH, President, USSR Academy of Sciences, who described the entire performance as all of us could have read in our own press (Washington Post, New York Times, etc.) and watched on TV. It is interesting to mention that, while describing the successive steps in achieving the current experiments since the inception of space feats, namely the launching of the first Soviet Sputnik, President Keldysh mentioned the first sorties in open space by man in 1965 (USSR Cosmonaut Aleksey Leonov) and the subsequent developments obtained on American spaceships GEMINI, in which docking of the spaceship with the Agena rocket was for the first time performed by hand maneuvering. This was followed twice, in 1967 and 1968 by automatic docking of AES "KOSMOS", while in October 1968 concomitant flight of spaceships "SOYUZ-2 and -3" was achieved with flier-cosmonaut Beregovoy, who conducted the experiment on search, rapprochement and maneuvering of spaceships. This time, a first assembly in orbit of an experimental space station was achieved and an experiment on crew exchange in flight was successfully performed. The station consisted of four compartments for the crew; it had good conditions for work and rest and was provided with diversified apparatus.

This experiment opens up new and broad possibilities to conduct diversified investigations in outer space from a constantly operational space station and to send scientists for a specifically required time. In this regard, the role of the experiments with Soyuz-4 and -5 is very great, since the preparation of future expeditions to other planets can be rationally achieved with the aid of docking several spacecrafts. The speaker then emphasizes the multi-purpose peaceful programs that are being carried out by all these methods.

While AS "LUNA-9" could allow us to have a direct "look" on the surface of the Moon, the successful flight of "VENERA-4" in October 1967 made possible the first direct measurements in the atmosphere of this mysterious planet, distant from Earth by more than 70 million miles. Currently, "VENERA-5 and -6" are on the path toward Venus; they are designed to pursue the research started by VENERA-4. (*)

AS "ZOND" was also successfully created and launched to great distances from Earth, allowing us to perform automatic as well as piloted flights, assuring the return to Earth with the second cosmic velocity.

There is still much unknown on the Moon and on planets, which is accessible to study by automatic stations, while certain problems require long-term investigations with participation of scientists and specialists in many disciplines. Orbital stations will find a broad application for conducting a wide range of astrophysical, geophysical, meteorological and other investigations. They will constitute a platform for manned penetration in the depths of outer space and will allow the scientists to get nearer the objects of studies, to widen the range of research in the course of a prolonged time. Orbital stations will unquestionably find a broad application for the solution of various problems of national economy.

At the end of his speech, President Keldysh highly praised the performance by the four cosmonauts, awarding them the gold medal in the name of Tsiolkovskiy.

SPEECH BY FLIER-COSMONAUT V.A. SHATALOV, COMMANDER OF SS "SOYUZ-4"

(Highlights)

The completion of the joint flight program of two spaceships SOYUZ-4 and SOYUZ-5 took place on 18 January 1969.

The program of flight foresaw:

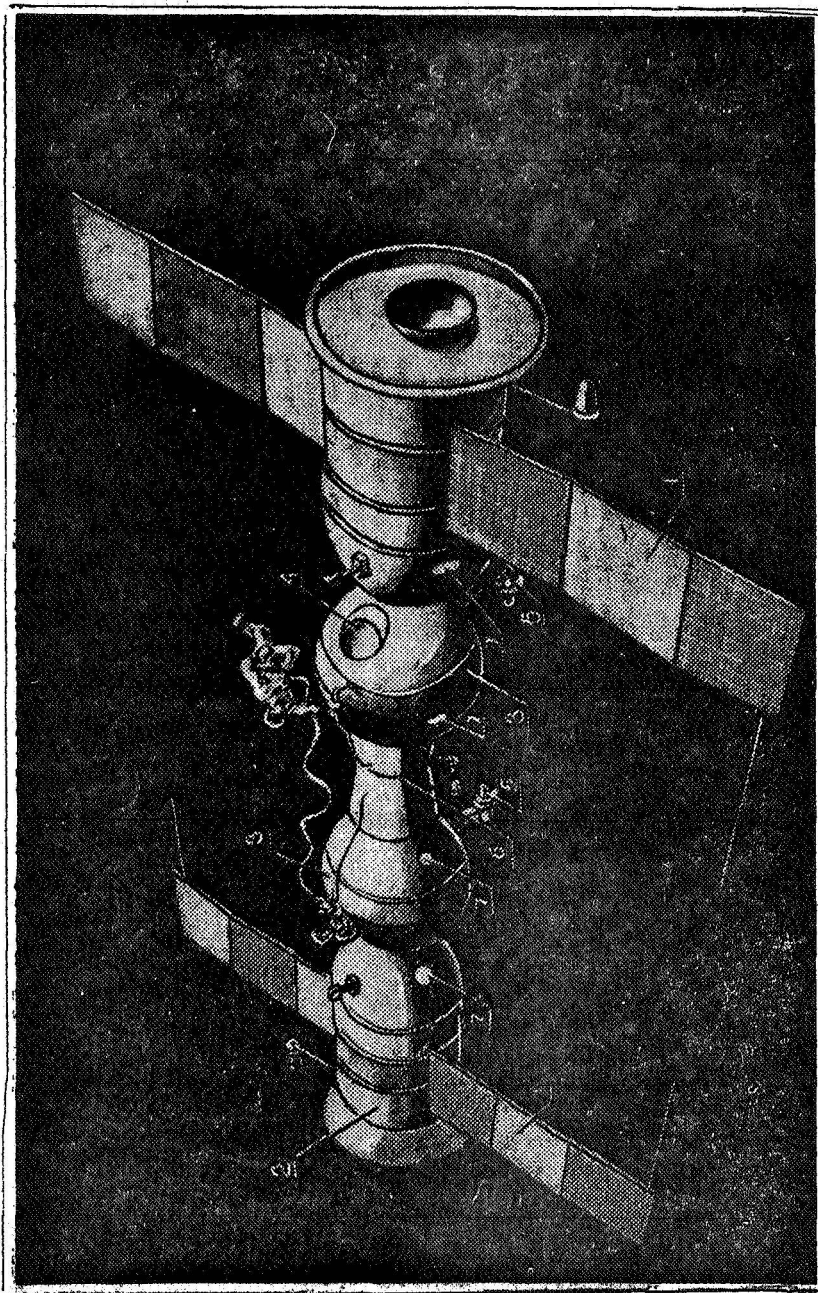
- the completion of remote rapprochement of spaceships, of close rapprochement, hand-operated mooring and docking for the realization of an experimental space station;
- transfer of two cosmonauts from one spaceship to the other through the open space and performance in the course of that transfer of a series of mounting and dismantling operations;
- test in space flight of spacecraft systems and, in the first place, of those of rapprochement, docking and assurance of cosmonauts' transfer;
- fulfilment in unitary, group or concomitant flights of a series of scientifico-technical and medico-biological experiments and investigations;

SS SOYUZ-4 was blasted off on 14 January 1969 at 1030 hours Moscow time.

Upon reaching the orbit, I performed the checking of systems' operation and undertook the manual orientation of the spaceship with solar batteries toward the Sun. At the same time, the spaceship, begun to maintain, as a gigantic gyroscope, the oriented position at the Sun, assuring spaceship systems' power feed at the expense of solar energy.

The state of weightlessness was already described more than once. Note

(*) "AS" stands for "automatic station", term used by the Russians.



SKETCH OF THE ORBITAL STATION AFTER DOCKING

1) solar battery panels, 2) descending capsule, 3) orbital compartment, 4) hatch to allow the emergence into outer space, 5) antenna, 6) docking joint, 7) illuminators

N.B. This sketch has been reproduced in the weekly "NEDELYA" of 26 Jan. 1969

that for the performance of complete, accurate and coordinated motions, a certain time is required, during which human organism gets adjusted to it. As far as I am concerned, it took me about 3 to 4 hours to master this state of weightlessness. During the first flight orbits I had to effect trajectory correction, so as to have it pass after one day through the region of SS. "SOYUZ-5" takeoff. To that effect I reoriented the spaceship and switched the correcting engine on in accordance with the computed time, having thus moved the spaceship to a new orbit.

Besides orbit correction, I performed in the course of the first day of flight a series of experiments concerned with photographing the Earth's surface, the meteorological setup on the ground, the Earth's horizon and conducting some astronomical observations. To perform these experiments, I had to abandon the ship's capsule and pass to the orbital compartment.

On the second day of flight, i.e., on 15 January 1969, flying in the region of Baykonur, I observed the bringing out of spaceship "SOYUZ-5" by the inversion wake.

After the latter's successful placement in orbit began the second stage of the flight, namely, spaceships' docking in orbit. Both SS Soyuz-4 and -5 completed manually a series of maneuvers assuring their further rapprochement from a distance of more than 1000 kilometers. When the range decreased to a few kilometers, subsequent approach was pursued by the automatic rapprochement system. On this system's command from Soyuz-4, the rapprochement-correcting motive installation was switched on several times. At the same time, gradual spaceship rapprochement was assured with a variable velocity, as a function of the distance. The automatic rapprochement was controlled by me with the aid of proper devices and visually by means of an optical viewfinder, and a television installation. At time of rapprochement, Soyuz-5 was oriented in the direction of Soyuz-4 by means of a docking ring.

Beginning with the 100 meter range, both Boris Volynov and myself switched to manual guidance of the spaceships. By doing so, we sustained their required mutual orientation. As previously, the rapprochement velocity was function of the distance between both spaceships.

When over African coastline, at a range of some 7000 to 8000 km from the Soviet Union, we approached one another by some 40 meters, completing the "sticking". At that distance, both of us performed several maneuvers, during which we somewhat modified the position of spaceships, and photographed one another. Further rapprochement was pursued within the TV communication with the ground, thus completing the docking. This process was watched by ourselves on the television screens.

In order to forestall a rough collision, the relative rapprochement velocity was decreased to a few tens of centimeters per second toward the time of contact. Mooring took place at that velocity, time at which the bar of the docking mechanism of Soyuz-4 penetrated into the nest of Soyuz-5's intake cone, thus achieving the mechanical engagement of both spaceships. Rigid tightening finally was achieved and the electrical systems of both spaceships were connected.

Thus was assembled a space station in orbit of the artificial satellite for the first time, and its experimental operation has begun.

The station consisted of four living compartments, mutually connected by telephone. Comfortable living conditions were maintained in these compartments allowing work and rest for the crew: the air temperature could be regulated between 15 and 25°C (60 to 77°F), the relative humidity could vary from 40 to 70% and the pressure between 760 and 800 mm Hg. The atmosphere composition was standard, terrestrial, i.e. 21% oxygen, the balance being nitrogen with less than 1% of carbon dioxide. Two of the compartments could be used as hatch chambers to ensure cosmonauts' exit into open space. Tests and verification of the proper operation of these systems in real flight were completed on 16 January 1969, when two of the crew of Soyuz-5, Yevgeniy Khrunov and Aleksey Yeliseyev, dressed in space suits, realized the transfer to SS Soyuz-4.

The transfer was controlled visually with the aid of television installations and optical viewfinder. During the transfer, constant telephone communication was maintained with the cosmonauts. Upon transfer, they handed over to me newspapers with data on SS Soyuz-4 and letters from comrades and relatives.

The program did not foresee a prolonged existence of the station, so after 3 orbits of joint flight, command for separation was given from the control panel.

The assembly and flight of the experimental space station allowed us to obtain the necessary material for the creation of durable scientific research stations.

Future orbital stations will require crew exchange, delivery of cargo and scientific equipment, the conducting of experiments on mounting and dismantling operations onboard and sending of the investigation material to the ground. Numerous parts of these operations were worked out in the course of the present flight of Soyuz-4 and -5.

After a series of comments on personal feelings, commander Shatalov reported the preparations for descent, beginning with the 46th orbit. All scientific equipment had to be packed in containers alongside with material on experiments, the photofilms and so forth. "After careful examination of the orbital compartment, we passed to the capsule and I began a pre-landing orientation of the spaceship". The motive installation was switched on on 17 January 1969 at 0911 hours and the ship obediently left the orbit to take the direction toward the Earth. At the outset we began to feel the atmosphere reentry by the gradual accretion of overloads, and then by flames in the illuminators.

The parachute system was put in action at about 10 km altitude and we descended slightly swinging on the parachute. Near Earth we switched on the retro-rockets and landing took place smoothly. During the descent with parachute a two-way communication took place with the helicopter and the aircraft of the searching group, who observed our descent. Later, the helicopter approached and we were met by their representatives, correspondents and friends.

Finally, the commander expressed his joy of having justified the confidence of the Fatherland and ended with a general vote of thanks to all those who made this joint flight possible.

SPEECH BY FLIER-COSMONAUT B. V. VOLYNOV, Commander of SOYUZ-5

(Highlights with Some Excerpts)

As you already know from the press communications, SS SOYUZ-5 was placed into AES orbit on 15 January 1969 at 1014 hours Moscow time with a crew of three cosmonauts.

I was the commander of the ship, Aleksey Stanislavovich Yeliseyev was the onboard engineer, and Lt-Colonel Yevgeniy Vasil'evich Khrunov was the research engineer.

The crew had before it the problem of fulfilling the following broad program of scientific experiments and observations, whose foundation was:

- rapprochement and docking of two spaceships;
- creation of an inhabitable experimental space station;
- emergence of two cosmonauts with their subsequent transfer to Soyuz-4.

The indicated program was completed successfully. After completing 49 orbits around the Earth, SS Soyuz-5 uneventfully soft-landed in a preassigned region of the Soviet Union, at 200 kilometers to the SW of Kustanay.

The commander elaborates somewhat on performances by Soviet scientists and specialists, expressing his thanks to all.

In connection with the program of flight, after performing manual orientation over the 5th orbit, he switched the motive power on and performed orbit correction with the view of meeting with SS SOYUZ-4 at a pre-assigned place of the orbit.

As a result of all these successful maneuvers, our ships entered the zone of action of the automatic rapprochement system and the automatic approach began at 1037 hours."

Follow the description of all these maneuvers, which is repetition of what was said by Commander Shatalov of SOYUZ-4.

Besides the capsule (cabin) the ship has an orbital compartment, which constitutes well supplied scientific laboratory, where we conducted all scientific and medico-biological experiments, observations and photographing. In this compartment it is possible to complete a series of physical exercises, which are necessary in prolonged state of weightlessness.

At time of cosmonauts' emergence into open space, the orbital compartment constitutes a hatch chamber, whose availability releases the cosmonauts from the necessity of constantly wearing space suits.

The next most important problem arising upon docking is the realization of Eng.Khrunov's and Yeniseyev's emergence into open space and their subsequent transfer to SS SOYUZ-4. Here the cosmonauts had to wear their space suits.

In all preceding flights, space suits were put on on the ground. In our case the slip on of space suits on board was performed for the first time. I helped the cosmonauts in performing all these operations, having given the order to go only after being assured of the operable conditions of the hatch systems."

SPEECH by Flier-Cosmonaut Eng. E. V. Khrunov

(Summary)

Eng. Khrunov briefly describes his duties as the onboard research-engineer in the flights of SS Soyuz-4 and -5 and his impressions during the performance.

His duties included the conducting of a series of scientific experiments and investigations.

One of his basic experiments consisted in the emergence in outer space and transfer from one spaceship to the other. During this transfer he had to study and check the locking systems, to appraise the possibilities of space suits and of the autonomous systems of life preservation. A series of mounting and dismantling operations had to be performed during transfer.

He then describes his personal impressions while over South America.

On the whole this account contributes nothing more from the technical viewpoint than had already been told by the spaceships' commanders.

SPEECH by Flier-Cosmonaut Eng. A. S. Yeliseyev

(Summary)

As the onboard engineer, A. S. Yeliseyev's duties consisted mostly in control and analysis of the performance of all ship's systems.

The description of the various compartments adds nothing new to what has already been reported in previous speeches.

Pausing on the questions of locking and transfer, Yeliseyev describes his personal impressions concerning the slip on and off of space suits. In weightlessness these operations are easier than on the ground, the space suit takes its shape easily and is slipped on without notable efforts. It is practical, with remarkable flexibility in the various joints, thus allowing the cosmonaut to perform the various mounting operations with ease. The ventilation and heat exchange are such that at no time did we feel any heat during the performance of the work, the transfer from one ship to the other. Nor was there any illuminator glass dimming due to moisture condensation.

Steady radio communication with the Earth and ships' commanders was maintained during the entire operation transfer. The locking systems of both spaceships operated with great accuracy. Both, the emergence hatch and that separating the orbital compartment from ship's capsule assured total hermeticity.

Prior to emergence into open space and after emergence, the crew operated in orbital compartments without diving outfits, but with usual flight suits. At time of transfer pressure in orbital compartments was zero. Both commanders worked in their chairs in ships' cabins, being separated from the outer space by the hood (cover) of the hatch.. However, the high technical reliability assured their total safety.

The speaker then concludes on the importance of this short-lived space station as the vanguard of future development of manned flights and of creation of long-lasting stations...

QUESTION AND ANSWER PERIOD

A usual question and answer period followed the press-conference. The first to take the stands to answer questions were V. A. Shatalov & B. V. Volynov. The questions put before them do not warrant reproduction here: the answers merely emphasize what was said many times in the speeches themselves. The only exception is perhaps the question relative to feelings of weightlessness in space during the performance of physical work. To the question: what muscles underwent particular stress and which overloads were responsible for it? The answer was that, at transfer, overloads were concentrated in hand muscles, which made it necessary to have strong hands and a very good physical training, which is never useless even after all-day work.

Questions asked of Eng. Yeliseyev dealt mostly with the onboard technical equipment. Obviously the spokesman emphasized the necessity for the onboard engineer to have perfect knowledge of every part or component of the ship, the difficulties in operating being mostly connected with weightlessness.

Perhaps the most interesting questions and answers were those, when the interlocutor was Dr. Keldysh.

The first question that was asked had reference to the season of flight, which so far never were undertaken in wintertime. Why has this become possible? Dr. Keldysh answered that the greatest advantage was in the search crew and facility in meeting cosmonauts on their descent. The connection was so accurate that cosmonauts landed almost at the same time as the helicopter, if not at the same spot.

Then someone asked if the continuation of experiments of flights past the Moon is still warranted? The Keldysh's answer was affirmative.

To the question as to the meaning "space station" derived from this joint flight and its prospects for the future, Dr. Keldysh answered that in the present case, mechanical and electrical docking was accomplished, which allowed both stations to operate as a unit, with the possibility of moving the equipment from one craft to the other. As a result of Soyuz-4 and -5 experiment, the mechanical problems of larger space stations have been solved, just as was the question of crew interchange.

There are several directions for outer space study. Let us say that flight of space stations to the Moon is an already accomplished feat, a stage that has already been won. In order to realize the landing on the Moon, or on Venus, at distances of hundreds of thousand or million kilometers, a very high level is prerequisite. So that we can not speak of the present success as the highest level with respect to all directions of outer space study, or, it is at least premature to speak in such terms. But I believe that in the development of orbital flights and constitution of orbital stations, this has been the highest level to date.

The next question, of particular interest, was in reference to the role of Soviet Union in international cooperation in space in accord with the obligations committed to international agreements. Would Soviet cosmonauts envision some joint flights with USA and what kind of flights might then be undertaken?

ANSWER by Dr. Keldych: In principle, we have no objections of any kind against such flights. Such a setup, it seems to me, has a series of advantages. In fact we participate in a whole series of international programs. As to the possible agenda of such an international program, one must think the things over. Perhaps, at some date, it would be possible to create a joint orbital station near Earth. And such a joint venture might perhaps be a flight to planets! Obviously this would be very interesting. But, to determine what can be made at this moment is difficult.

QUESTION: Did the principals of the Soviet space program receive any useful information concerning the flight of "APOLLO-8"?

ANSWER: We received the information that was published in the press. No technical information on the setup of the various compartments and aggregates of this station is available to us besides what has been published. It must be stated that we also already resolved, in a parallel fashion, the basic questions linked with the longer-range flights. This is the case, for example, of return to Earth of crafts with second cosmic velocity, which was realized on ZOND-5 and ZOND-6. But I must say that the realization of such a significant flight as that of "APOLLO'8", even if in its details, it does not include anything somewhat new nor more concrete data, it still in itself contributes something to us.

QUESTION: How would you characterize the difference in the concepts on mastering the outer space between USSR and USA?

ANSWER; This is a question probably most difficult to answer. I believe, of course, that there are many common directions, let us say, a great deal of common in the study of the near-Earth space. There is much in common also in the fact that both we and the USA have realized flights of automatic stations to the Moon. After our "LUNA-9", USA landed "SURVEYOR". Both ourselves and USA sent crafts toward Venus. There are also such disciplines as radiocommunication and television. All this is common, though there are differences in the concrete solutions of some problems. Perhaps the greatest differences are in the fact that USA emphasized the landing of manned spacecrafts on the Moon and their return, which is now the objective of the APOLLO program. Thus far, we made no particular effort in that direction. On the whole, we consider that we must make a closer approach to interplanetary flights. To that effect, automatic stations must be sent at the outset, so as to investigate anything that can be encountered in outer space. There must take place a general development of space technology and one of the first steps in that direction is the experiment discussed today.

QUESTION: Because of the successful flight of SOYUZ-4 and SOYUZ-5, what problems have now become "ripe" and in what direction should we now operate?

ANSWER: I feel that we should seek a deeper knowledge of the near-Earth space, a better use of orbital flights for various aims in connection with progress on Earth. Such are, for instance, meteorological radio services, which should be improved and meteorological forecasts. An important direction is also that of solar system's planets which still conceal a great deal of unknown and uninvestigated. On the whole this amounts to emphasize large acting orbital stations and, naturally, long-range interplanetary flight.

QUESTION: What is the role of the "SOYUZ" in the creation of an orbital laboratory, and can we now foresee when it will be operational and what its construction is to be?

ANSWER: I already spoke about that. I consider that all questions of principle for the creation of large stations have now been verified. That very same station of two "SOYUZ" will conduct experiments in further flights. We opened up the path to the creation of a permanent orbiting laboratory with exchange of crews. Obviously the creation of a large station will take some time, but I think that this delay can be evaluated in terms of years, not decades.

QUESTION: May we expect in the near future Soviet manned flights to the Moon?

ANSWER: We already communicated to the press that spaceship "ZOND" is adaptable to manned flights. Obviously, no such flight will be undertaken within two or three weeks. When this is to take place is something entirely dependent on the future planning of our program.

***** END OF THE PRESS-CONFERENCE *****

(T A S S)

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